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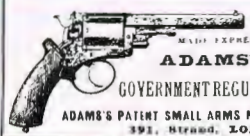
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577 BORE,
EXPRESS RIFLES.

97 inch,
160 grains
622
MARK

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Contributors

Philip Ackroyd joined Dyestuffs Division in 1953 as a technical officer in Dyehouse Department. Has since visited South America, Mexico, USA and most European countries as a specialist in pigments for the mass-coloration of viscose rayon. Is an associate of the Textile Institute.

Kevin Howley, a maintenance clerk in the Millwrights Office at Billingham Division's Engineering Workshops, took up football refereeing in 1943 while in the Royal Navy. In 1954 was promoted to the Football League and was selected in 1957 for the FIFA panel of referees. At 35 he was the youngest referee to have charge of a Wembley Cup Final. Has refereed in eight countries at international and European Cup games.

Harry Hutchison was trained as a chemist and now edits Nobel Division's fortnightly newspaper, the *Nobel Times*. Is an enthusiast for Robert Burns.

Gordon Long, whose article is based on a BBC Woman's Hour talk, is a one-time journalist who joined ICI just before the war. Now Assistant Publicity Controller (Public Relations). Has many hobbies, including house decorating, "mucking about" in the garden and helping with his son's Latin prep—all of which he loathes.

Cedric Shipley is an estimator at the Heysham Works of Billingham Division. Started there as an apprentice in 1944. Spends much of his spare time working for his local parish church, where he is a lay reader.

Dorothy Thomas is assistant publicity manager at Imperial Metal Industries (Kynoch) Ltd. Before that she was in charge of Metal Division's internal relations. Has contributed several articles to the *Magazine*.

Cover

A symposium of Kynoch cartridge labels

The ICI Magazine, price twopence, is published monthly for the interest of all who work in ICI, and its contents are contributed largely by people in ICI. Edited by Sir Richard Keane, Bt., with the assistance of Colin Forbes as art editor and Anne Bilsland as news editor, it is printed at The Kynoch Press, Birmingham, and published by Imperial Chemical Industries Limited, Imperial Chemical House, Millbank, London S.W.1 (phone VICtoria 4444). The editor is glad to consider articles and photographs for publication, and payment will be made for those accepted.



Philip Ackroyd



Kevin Howley



Gordon Long



Cedric Shipley

I HAVE just finished reading a book which has opened my eyes to what is currently going on in Burnley. According to the author (Lord Francis-Williams, *The American Invasion*) it is nothing like what it was in the good old days before the war. In the 1930s it was much the same as many other medium-size Lancashire cotton towns: a squalid heap of decaying back-to-back slums overshadowed by belching mills. The sanitary arrangements dated from the middle of the nineteenth century. There were usually adequate—but poorly paid—jobs for women and girls in the nearby factories, but the men were often unemployed. There was an ample supply of dingy pubs and nearly as many pawnbrokers; the pubs were not too prosperous, but the pawnbrokers seemed to be all right.

The New Age

But now, according to Lord Francis-Williams, all these fine old institutions have gone; they have, he mourns, been swept away by an avalanche of Americanisation. The people of Burnley have had their sturdy, democratic, poverty-ridden ways of life undermined by American values, American ideas, and American investment in local industries. The results horrify Lord Francis-Williams: in his own words, "The majority are happy in their work. Inside the new factories everything is bright and clean; the new industries require space for parking lots for the cars of the workers," who now come not from adjacent slums but from spacious housing estates on the edge of the town. These same degenerate workers throw away their money on washing machines and refrigerators, cosmetics and hair-do's, foundation garments and leather shoes (clogs are out).

But things are even worse than that. Wringing his hands in horror, Lord Francis-Williams points out that in the centre of Burnley there is now a new skyscraper hotel where the porter carries the visitor's bag up to his room—and it is a room with a private bath, a telephone and central heating. And then—the ultimate

horror of the Americanisation of Burnley—the hotel has a French cook and is prepared to serve guests with meals until midnight! Americanised Burnley is the shape of things to come. In the author's words, "Unless we take care, that is the shape of our future."

Now, one could dismiss this sort of thing as the product of two familiar emotions: in part, it comes from the hysterical nationalism that has bred misery and violence throughout the world over the past hundred and fifty years; and, in part, it comes from the warped type of Puritanism that hates to see people abandoning stark austerity in their living conditions. But the nonsense is also derived from a complete ignorance of



Mark Abrams

elementary economics and, to that extent, should be taken more seriously.

The first chapters of Lord Francis-Williams' book are given over to a welter of statistics showing (and bemoaning) how much American capital is now invested in the British economy. But the same figures should lead to a very different reaction. They show, for example, that at a time when we desperately need to increase our exports the comparative handful of American firms in Britain are already producing over one-tenth of our

Invasion or Salvation? by Mark Abrams

exports. They show that over a period when the rate of native investment was lagging behind that of nearly every other West European country, the Americans were providing the British economy with vast sums of money for new factories and new machines. While our old traditional industries such as cotton, coal and ship-building were languishing, the Americans were adding to the British economy a wide range of new and flourishing industries—the sort which have "growth" potential for the second half of the twentieth century—office appliances, electronics, pharmaceutical drugs, processed foods, mechanical handling equipment, domestic equipment, oil refining and many others. The same figures also show that American firms in this country are providing additional jobs for British workers at five times the rate that all other firms in Britain are expanding their demand for labour.

Living Standards

The truth is that without the "American Invasion" we certainly would not have managed to raise our average standard of living by roughly 20% over the past twelve years. Indeed, it is probable that without the initiative and capital of the invaders not only would we be poorer but we would also have a good deal more unemployment. In judging this American contribution to the British economy, instead of invasion it would be more sensible to talk about salvation.

Throughout the nineteenth century and up until the first world war, Britain herself did a great deal of "invading" other countries along the lines deplored by Lord Francis-Williams. And if ever the world outgrows jingoistic nationalism and history is rewritten, it is probable that the historians will praise nineteenth-century Britain not for the wars she won or the colonies she acquired, but for the lavish way she exported capital and thus provided other nations with the equipment and resources necessary to raise their own living standards.

The opinions expressed in this article are not necessarily those of the Company



George Kynoch, founder of Kynoch Works, born 1834, died 1891



OUR MARK

Next month Kynoch Works—for 36 years the centre of ICI's metal producing interests — celebrates its centenary. Its energetic and eccentric founder, George Kynoch, merits more than the official praise customarily dispensed on such occasions.

by Dorothy Thomas

THE story of ICI is studded with personalities who became legends in their own lifetime—who started at the bottom of the ladder and ended, full of years and honour, on the topmost rung. George Kynoch's place among them, though assured, is exceptional, for he climbed dangerously high and fell ignominiously low, dying in exile and near-disgrace in early middle age. Bewildered biographers alight on him now as an industrialist of unquestioned stature, then as a profiteer of dubious integrity; here as the friend of kings, there as "the lowest type of pothouse politician." Even in 1962, when he is rightly honoured as the founder of an important manufacturing concern, it would be a poor historian who neglected the fascinating byways of his career and character.

His was not the traditional "rags to riches" story: his background, though humble, was never dramatically poverty-stricken. The son of a journeyman tailor, he was born at Peterhead, Aberdeenshire, in the summer of 1834 and modestly educated at the local National School. His working life, progressing from a Glasgow insurance office to a Worcestershire bank, might have continued along these honourable if narrow paths had he not, in his early twenties, been transferred to a larger bank in Birmingham. Immediately at home in this seething industrial community, Kynoch lost no time in shaking off the shackles of security and allying himself with the most erratic and dangerous of all the city's thousand trades—the manufacture of percussion caps and cartridges. In what capacity we do not know, he joined the firm of Pursall and Phillips in Whittall Street, not far from the centre of Birmingham.

The lack of respect then accorded to highly explosive raw materials was, by



As M.P. for Aston Manor (1886-91), George Kynoch criticised the Government for the outmoded rifles and cartridges it supplied to its soldiers. In this cartoon Kynoch is crowned with a Martin's patent lamp, one of his "sidelines"



ABOVE: **Mrs. McNab**, the almost legendary character who ran Kynoch's cap-making department as a sub-contractor. Kynoch's gave the order; she did the rest. Her department grew from this hut to one turning out 450 million caps a year



BELOW: **Dressed in their Sunday best**, Pay Office staff muster in the '90s for a Works outing

today's standards, truly terrifying. The newspapers of the time reported with monotonous regularity (and a wealth of gruesome detail) disastrous explosions in tiny, congested factories, packed with explosives, warmed by open fires and lit by inefficient oil lamps. Many of the victims were children 10-14 years old, whose small unskilful fingers dabbled the day long in fulminate of mercury and other treacherous compounds.

George Kynoch took to his new surroundings like the proverbial duck to water. So much so, indeed, that within five years he had taken over the business and, on a new site, formed the nucleus of an industrial enterprise which was to expand with phenomenal rapidity and flourish for more than a hundred years. The circumstances in which these surprising events occurred emphasise a dominant aspect of Kynoch's complex character—an irresistible urge to seize any opportunity, however eccentric.

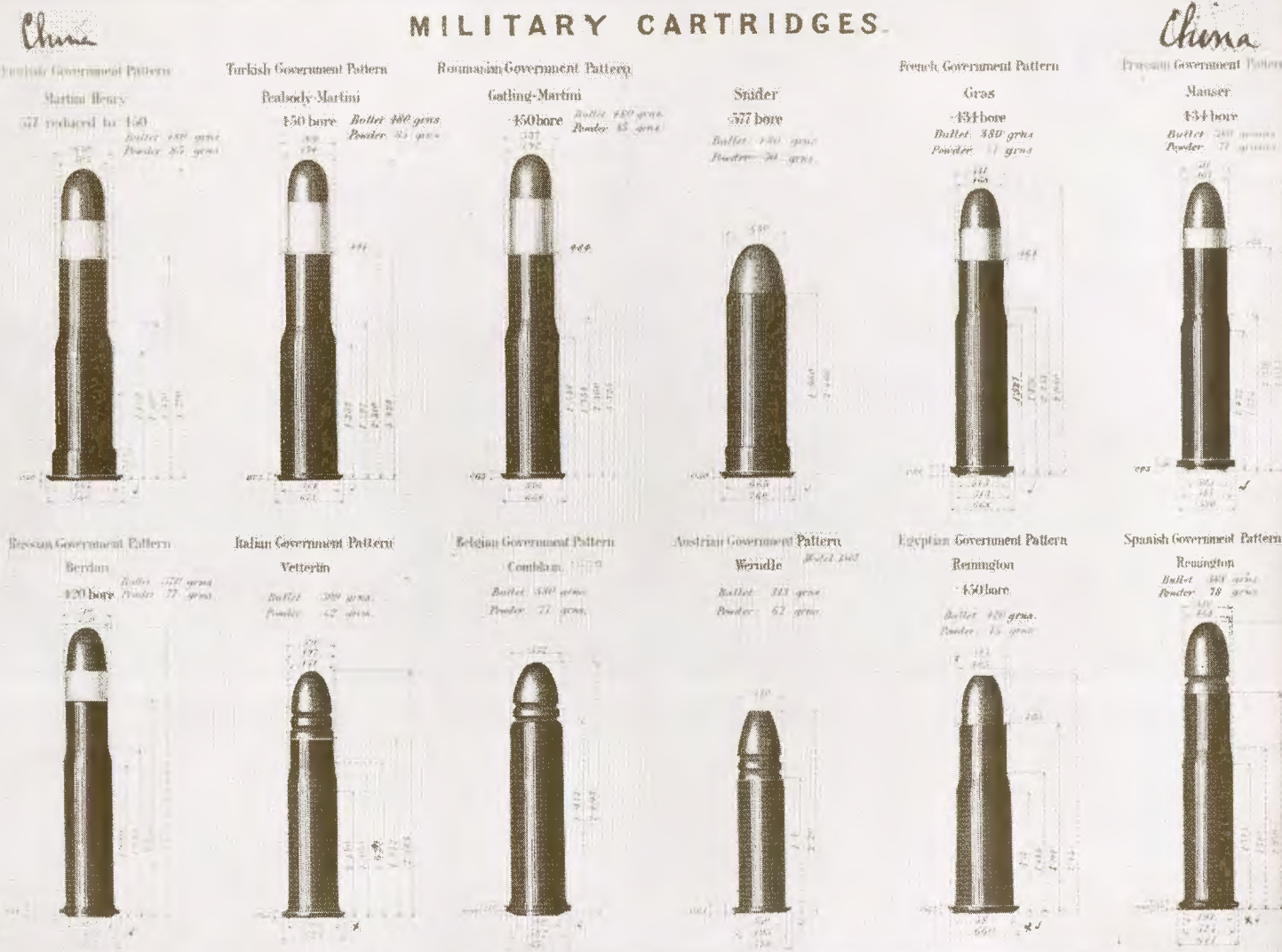
Removal to Witton

Late in 1859 the Whittall Street factory was totally destroyed in an explosion which killed 19 of its 70 employees, gravely injured many others and severely damaged surrounding property. Somewhat belatedly, the official and public conscience awoke to the fact that a densely populated area was unsuitable for "places where gunpowder or detonating substances are necessarily used," and steps were at last taken to introduce some measure of control over such activities, including their location. So Mr. Pursall, then operating in temporary premises, applied for a licence to erect a powder magazine and percussion cap manufactory at Witton, some 3 miles north-west of Birmingham and then described as "a countryside of babbling brooks, smiling meadows and green trees, amidst which the song of the cuckoo is heard as early as in any part of rural England." The new factory was not, however, to operate under the somewhat suspect supervision of Messrs. Pursall and Phillips. The man in charge, who a year later was formally recognised as proprietor, was the former Scottish bank clerk, George Kynoch. How in so short a time he managed to equip himself for such alarming responsibilities—still less how he

Knocking-off time about 1915. The lion was the Kynoch trade mark, and until 1930 the factory was known as *Lion Works*



MILITARY CARTRIDGES.



MAXIMUM DIMENSIONS

found the money to do so—is one of several unsolved mysteries of Kynoch's life.

The 4-acre plot at Witton, leased for £32 a year, was invaded by the builders early in 1862—briefly, as their contract expired with the erection of a small wooden shed. Expansion was rapid, however, for capacity was at once doubled by the addition of a second shed, trundled on rollers from the city. This double shed—the hub from which the whole vast 250-acre Kynoch Works was eventually to radiate—was for many years the pride and kingdom of a remarkable woman, Mrs. McNab, whom Kynoch thankfully recognised as a worthy “partner.” Starting work there at the age of 12, she was made forewoman of the cap department ten years later—a post which, in those days, made her an employer in her own right,

acting as a sub-contractor to the management. All Kynoch had to do was give Mrs. McNab a note of current requirements: from then on she was on her own. Under her care Kynoch caps acquired a world-wide reputation for reliability, and business grew to the fantastic level of 450 million caps a year. A legend to the last, Mrs. McNab served the company for 40 years and remained its pensioner for a further 45, dying in 1947 at the age of 97.

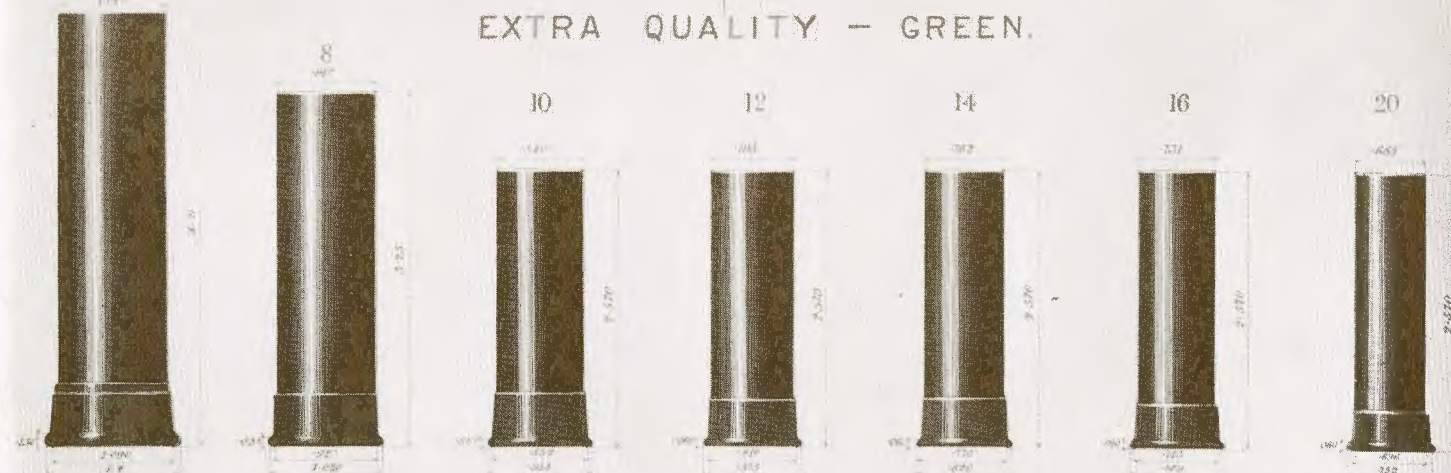
Wisely content to delegate this side of the business, Kynoch was anything but a sleeping partner. Within five years the original shed was merely one outpost of a relatively enormous factory, incorporating several large, solidly built workshops, a series of well-spaced loading sheds, and the first towering chimney stack ever to desecrate the lambent horizons of Witton.

All this time, business in the second large-scale Kynoch enterprise, cartridge manufacture, was also thriving. Here some element of luck entered in, for this was an era of unusually rapid development in the world of arms and ammunition. Cartridges as we know them today were still a comparatively recent innovation when Kynoch started making them, and changes in design—notably the gradual adoption of more and more metallic components—were frequent. But it was in the early '80s, when the British Government somewhat tardily adopted service ammunition with solid-drawn cases, that Kynoch earned true fame—not only as a manufacturer but as the patentee of a technical device of dazzling simplicity and effectiveness.

Typically, Kynoch was not satisfied

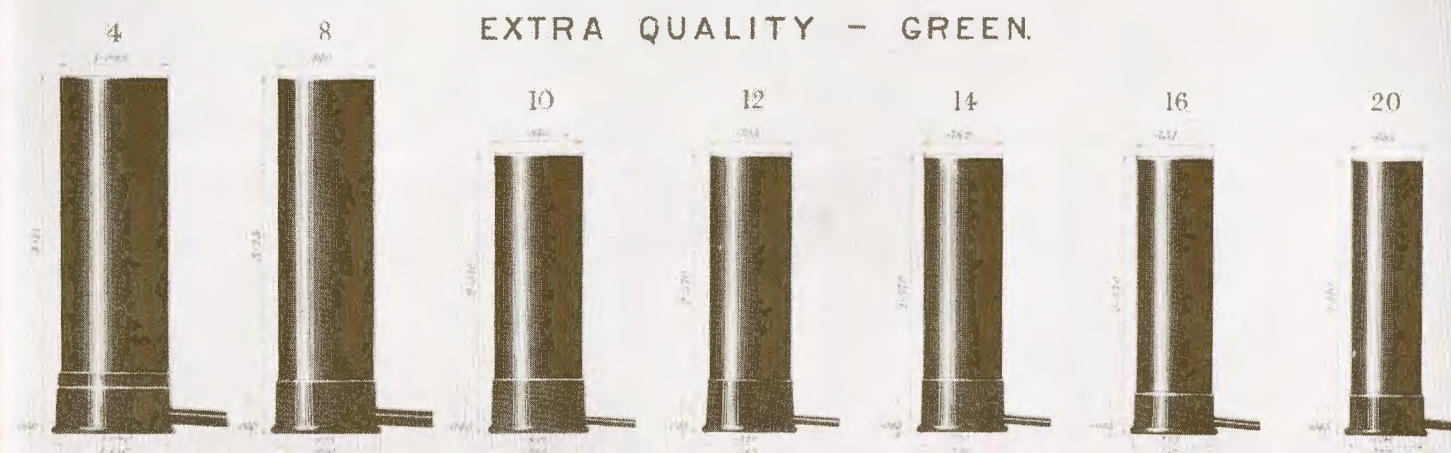
CENTRAL-FIRE CARTRIDGE CASES FOR BREECH-LOADING SPORTING GUNS.

EXTRA QUALITY — GREEN.



PIN-FIRE CARTRIDGE CASES FOR BREECH-LOADING SPORTING GUNS.

EXTRA QUALITY — GREEN.



MAXIMUM DIMENSIONS.

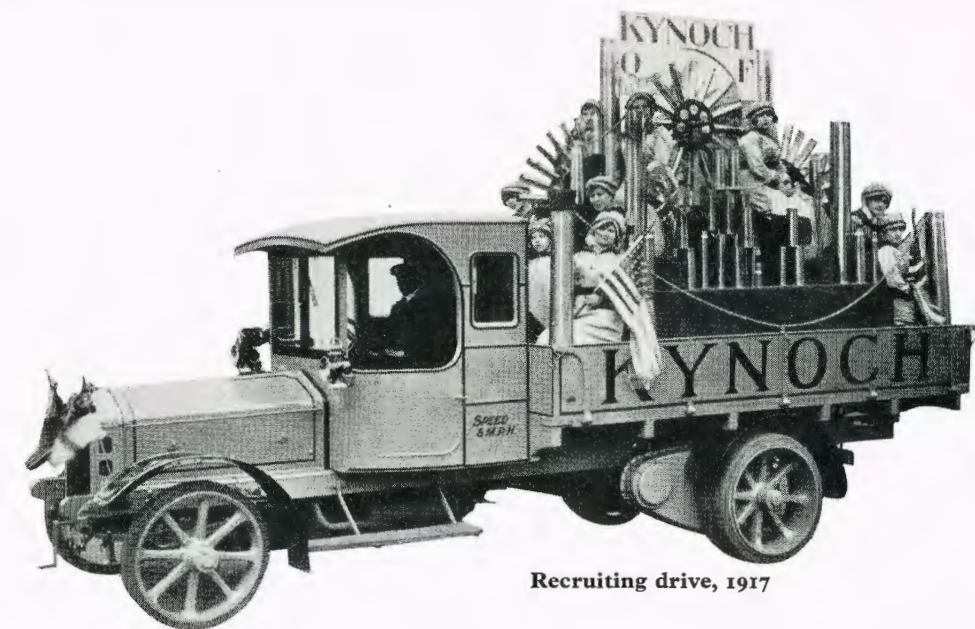
merely to take advantage of a virtually ready-made market. When, in the late '70s, he realised that metal components had come to stay, he set about establishing his own source of metal supplies. This he did, not by introducing brass manufacture to Witton, but by the more personally profitable means of operating an existing rolling mill on another site and under separate management. This “side-line,” which his successors took over and later moved to Witton, laid the foundations of a business in wrought metals whose scope even George Kynoch could never have envisaged.

This was by no means Kynoch's only “fringe” interest. By the time his works at Witton were twenty years old he was the proprietor of a gun factory, a patent lamp business, and a small but lively printing

office (the story goes that this was started out of pure devilment after a personal disagreement with his usual printer). As well as Britain's second-largest ammunition factory, he had depots or agencies in cities all over the world and was *persona grata* at several foreign courts and with many rival governments. With a considerable personal fortune at his disposal, he had by now assumed the role of local “squire,” living in luxury at nearby Hamstead Hall and throwing open its 300-acre park with calculated benevolence for “festivities, gala days and picnics.” He became the zealous patron (later president) of Aston Villa Football Club and other local sporting ventures, including the Birmingham Gun Club.

He was still not satisfied. His plans for the ammunition factory were as gran-

diose as ever, and a latent appetite for political and public service was beginning to demand satisfaction. In other words, he needed more money and more time to himself. The step he took to achieve these ends—converting his firm into a limited company—was in the short run successful and in the long run disastrous for him. In 1884, investors willingly paid him £110,000 for his business assets, nominating an aristocratic board to direct general policy and appointing Kynoch himself managing director. Some of this money went into furthering his political ambitions, and when, two years later, he staged a vigorous if unconventional campaign at the hustings, he was enthusiastically returned by his constituents/employees as Conservative M.P. for Aston Manor.



Recruiting drive, 1917

On the business side, however, things were going badly. Not surprisingly, Kynoch did not take kindly to having his decisions questioned by fellow directors who were, to say the least, somewhat inexperienced in business matters. For their part, they resented Kynoch's independence—still more his sometimes questionable speculations outside the company—and with rare unanimity blamed him for all that went amiss. Efficient management became impossible and inefficient management brought its inevitable reward: after only five years the firm of G. Kynoch & Co. Ltd. was perilously near bankruptcy and its former owner was juggling ineffectually to stabilise conflicting financial interests.

The crisis came late in 1888, when shareholders, through a committee, took matters into their own hands. With commendable despatch they swept away the existing management, and themselves embarked on a rigorous programme of rehabilitation, respectfully requesting Mr. Kynoch to resign "on the grounds that the duties of M.P. are not consistent with the office of Managing Director." Urbanely, he said he would consider the matter, and a fortnight later wrote from Hamstead Hall tendering his resignation "owing to the state of my health." Soon afterwards he departed for the sunshine of South Africa, leaving his faithful constituents with a nice problem of parliamentary non-representation.

Rumours still abound of Kynoch's

sojourn among the South African gold-fields, but the hard truth remains that he never amassed sufficient money to pay his debts and resume his place in industry or society. Ironically, his "state of health" did in the end solve his problems for him: during his second year in South Africa he fell victim to a fatal and agonising disease, and early in 1891 he died at Johannesburg.

It was a pitiful end for a man of so many gifts. Even his most disinterested biographers recognised that he was, in every sense, a "big man," with an enormous capacity for work, a towering personality, and an instinct for inspiring confidence and affection which was far from common among leading industrialists of his day and age.

Chamberlain to the Rescue

It is intriguing to imagine his reaction to the many twists of fortune—some kind, some cruel—which were to enliven his factory's future. Sardonic respect, perhaps, for the ruthless calm with which his successor, Arthur Chamberlain, wrenched the Kynoch ship into less perilous waters; a twinge of envy for Arthur Chamberlain, junior, controlling a dizzily expanding ammunition and explosives empire in the fabulous days of World War I; and at least one raised eyebrow when the long-famous name of Kynoch Ltd. disappeared under the impersonal identity of ICI (Metals) Ltd.

Contemplating the long switchback of years good and bad, he could at least be certain that something of his own vigour and determination has survived to carry Kynoch Works into its second century.

Kynoch's Angels as they were locally known; these women turned out rifle cartridges by the million in the 1916 munitions drive

People and events . . .

Record Capital Expenditure Last Year

A HIGHLIGHT of the Annual Report published last month was the disclosure of expenditure in 1961 on the Company's programme of construction in the UK. It reached a record £46 million, compared with £34 million in 1960 and £32 million in 1959.

During 1961 additional capacity for polyurethane chemicals, chlorinated solvents, methyl methacrylate, nitric acid, nylon, 'Melinex' film and 'Terylene' was brought into

RESULTS IN BRIEF

	1960	1961
	£m	£m
Group sales to external customers in the United Kingdom	303.1	298.1
Group sales to external customers outside the United Kingdom	255.3	252.3
Total Group sales to external customers	558.4	550.4
F.o.b. value of exports from the United Kingdom	96.6	97.5
Group manufacturing and trading profits less losses (before tax)	93.6	65.9
Income (after tax) of Imperial Chemical Industries Ltd	39.7	28.8
Total capital expenditure by the Group during year on properties, plant and equipment	43.9	65.1

DISPOSITION OF GROUP SALES PROCEEDS AND OTHER INCOME

	1960	1961
	£m	£m
Manufacturing and trading proceeds and income from investments, etc.	568.9	562.1
Raw materials for production and maintenance, purchases for re-sale and payments for external services	302.6	312.6
Wages and salaries	124.0	130.1
Pensions and contributions to Pension Funds	8.4	8.3
Depreciation	37.2	40.5
Employees' Profit-Sharing Bonus	8.6	8.7
Taxation	40.5	27.8
Retained for employment in the business	23.9	9.1
Distributed as net dividends	23.7	25.0
	£m568.9	£m562.1

'Group' means ICI and its subsidiary companies at home and overseas.
'External customers' means customers outside the Group.

use. In the near future it is planned to start up the first plants, making ethylene oxide and ethylene glycol, on the new Severnside site. Among the plants to come into operation during 1962 will be additional capacity for the manufacture of polyvinyl chloride and 'Perspex.'

Capital expenditure sanctioned during 1961 was also up and amounted to £73 million, compared with £40 million in 1960. Among the larger projects sanctioned were extensions of manufacturing capacity for dyestuffs, paraxylene, 'Terylene' filament yarn, polypropylene (including film), polyvinyl chloride, methyl methacrylate, dendritic salt and leather-cloth; the construction of a crude oil distillation plant on Tees-side which will supply petroleum feedstock and fuel oil to the neighbouring works of the Company; the development of IMI (Kynoch)'s strip mill at Birmingham; and the construction of new research laboratories.

The plant at Kilroot in Northern Ireland for the manufacture of 'Terylene' filament yarn which was sanctioned during the year is expected to be in production in 1962. A new factory for the manufacture of concentrated complete fertilizers, which is being built near Belfast by Richardsons Fertilisers Ltd., should also be finished by the end of the year.

Princess Margaret at Wilton

SOME 5000 members of employees' families, brought to the factory in a fleet of buses which ran a shuttle service from various centres on Tees-side, were present to give a royal welcome to Princess Margaret when she visited Wilton Works on 10th April.

Lining the road inside the factory's west gate, they were the first to catch a glimpse of the Princess as she entered the works after she had formally opened the new Cobalt Bomb Unit at a hospital in Middlesbrough, a few miles away.

The Princess, dressed in lime green, was received by the Lord Lieutenant of the North Riding, Sir William Worsley, Bt., at the entrance to the solvents area control room on the Nylon works of

Dyestuffs Division. Here the first of a number of presentations to the Princess took place, among them Mr. R. A. Banks, ICI Group D director, Mr. J. C. H. McEntee, chairman of Wilton Council, and Dr. J. Avery, chairman of the Dyestuffs Division. After touring the control room, where the Princess spoke to operators and handled some displayed nylon polymer chips, the royal party drove round the site past many groups of Wilton employees who gathered at points nearest to their places of work.

Other calls were made at the 'Terylene' works of Fibres Division, where further presentations took place and where the Princess saw the staple fibre processing area and the new 'Ulstron' yarn being manufactured.

Next came the 'Perspex' plant of Plastics Division, one of the first plants to go into production at Wilton in 1949. Here the Princess saw 'Perspex' sheets being made, spoke to some of the operators and had presented to her a number of plant employees.

She was most interested in a display of 'Perspex' products which she saw before leaving the plant for Grange Restaurant for tea and further presentations. There too was a display of products made from the materials produced at Wilton, including some modelled 'Terylene' garments.

Finally, as the royal party left the site via Grange Farm Road on the way to RAF Station Middleton St. George, employees from the Castle area were the last to wave the Princess on her way.

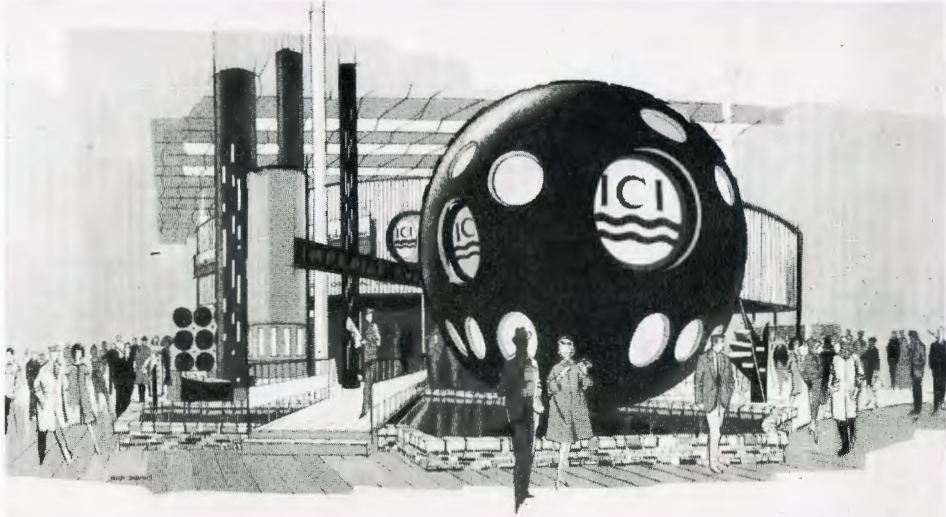
No Stings

ONE of Nobel Division's silicone products is playing its part in an important research project on rheumatism now being conducted by Birmingham University.

A country belief held for many centuries claims that beekeepers do not



suffer from rheumatism to the same extent as other people because they are frequently stung, and bee venom is



An artist's impression of ICI's stand at Stockholm

currently being employed to test this theory that it will help rheumatic complaints.

The venom is supplied to the University by Mr. D. J. Palmer of Codsall, a well-known beekeeper. A neat bit of scientific ingenuity involving Nobel Division's 'Silcoset' rubber allows him to retain his stock of bees alive although having milked them of their venom. This is how he does it. From 'Silcoset' 101 room-temperature curing rubber he has made a sheeting on which he places 200 or more bees and then administers a mild electric shock. Not surprisingly this arouses the bees, who bring their stinging mechanism to work. The stings, however, cannot penetrate the silicone rubber sheet, so all that happens is that a minute drop of venom is left on the sheet, while the bee retains its sting and consequently its life.

If you have suffered a really painful bee sting, you may be surprised to learn that Mr. Palmer has to activate 10,000 of his bees to collect about one gramme of venom.

Britain in Sweden

LATER this month the British Trade Fair opens in Stockholm. ICI's stand is one of the largest in the exhibition and will display the products of fourteen ICI Divisions, subsidiary companies and associated companies. It has been planned by Central Publicity Department and designed by Victor Rotter, FSIA.

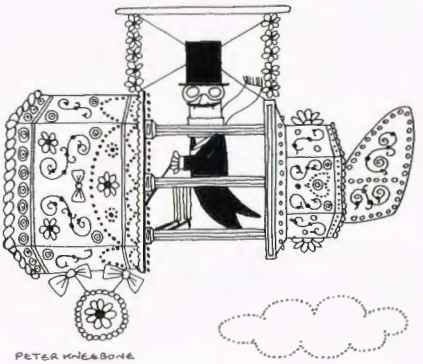
A striking feature is a large globe (see our artist's impression above) over 60 ft. in circumference which contains "port-hole" displays symbolising the activities of the Divisions. The stand has been designed to give information about ICI, its products, and its trade with Scandinavia. Another feature is a 36 ft. long

colour transparency of Wilton at night—to the best of our knowledge the largest transparency ever made.

Of the various Divisional exhibits on the stand, Plastics Division are featuring articles from all over Europe made from their materials and Heavy Organic Chemicals Division has used its standard export drums built into a wall to house its product displays.

A Piece of Cake

A TWO-TIER wedding cake made in Manchester was delivered at a reception more than 5000 miles away in Los Angeles, California, without a crumb out of place. It completed the long journey by air in perfect condition, protected in a container and packing made from polyurethane foam.



The suppliers of the cake took their unusual packaging problem to Dyestuffs Division, who came to the rescue by suggesting the use of newly developed materials of a similar kind to those used as safety pads on car fascias. The materials, which have been designed to withstand shocks, were found to be ideal for packing the fragile cake.

Each tier of the cake was held firmly

In Brief

Attending Duke's Conference. Two ICIANZ men, Mr. R. D. Malcolmson and Mr. J. F. Pilbeam, will be members of the Australian delegation to the Duke of Edinburgh's Study Conference being held in Canada later this month.

Picked for India. Miss Patricia Patterson of ICI (India)'s Industrial Welfare Department was vice-captain of the All-India women's hockey team which made an official tour of Ceylon recently.

Mr. Peter Allen, ICI overseas director responsible for Western Europe, has been appointed to the Export Council for Europe.

Minister's visit. The Minister of State for Wales, Lord Brecon, visited Cooke's Explosives Ltd. at Penrhynudraeth on 7th March. A ciné film of the visit was made and appeared on the Welsh ITV the following afternoon.

Scout medal. Nobel Division pensioner Mr. W. O. Cameron has been awarded the Medal of Merit of the Boy Scouts Association. His scouting connections date back to 1909, when he started the first Scout patrol at Fortrose, Ross-shire.

Adopted by Wallsend. Mr. W. E. Garrett, who is a fitter at Prudhoe Works has been adopted as prospective Labour candidate for Wallsend. He has previously contested parliamentary elections at Hexham and Doncaster.

Boat Show prize. Mrs. Joan Dobson, a secretary in the Organisation and Methods Department of Witton, won a fibreglass catamaran for her entry in a competition at the Boat Show which was held at Birmingham's Bingley Hall.

Zoology Award. The Zoological Society of London has decided to make an annual award, to be known as the Stamford Raffles Award, to one amateur zoologist or to a professional zoologist for contributions to science extending beyond his field of specialisation. The first of these awards, for the year 1961, has been made to Mr. W. S. Bristowe, Head of the Central Staff Department, who is a leading authority on spiders and hunting wasps. The award

takes the form of a Henry Moore bronze, which was presented to him by the Duke of Edinburgh.

Alkali youth awards. Alkali Division's Inman Youth Trophy and Endeavour Cup have been awarded this year to John Horsfield, an Avenue Works apprentice artificer, and Terence Healey, an apprentice fitter at Fleetwood. The awards go to the best apprentice and the best "trier" respectively.

Labour candidate. Dr. Jeremy Bray, a Wilton Works mathematician, has been chosen as prospective Labour candidate for the Middlesbrough West by-election. In the last general election he unsuccessfully contested Thirsk and Malton.

On view. Fibres Division staged the first public exhibition of its latest synthetic fibre 'Ulstron' polypropylene at three centres in Norway last month. On view were 'Ulstron' fishing nets and twines.

FBI membership. Dr. J. M. Holm, chairman of Nobel Division, has been elected a member of the Scottish Council of the Federation of British Industry.

Two million. On 13th March Stowmarket Works, Paints Division, achieved two million man-hours without a lost time accident, which is the first time any Paints Division factory has achieved this figure.

Pensioner's brainwave. Mr. Alfred Pitt, a Kynoch Works pensioner who used to work in the engineering workshops before he retired in December last year, has been awarded £100 under the ICI Suggestion Scheme for designing a new tool to turn the ends of sporting cartridges over to hold the end wad. His five previous suggestions also won awards, but until now none topped £20.

Down our way. Dr. A. Y. Livingstone, assistant works manager of Dyestuffs Division's Grangemouth Works, was one of a number of people interviewed by Mr. Franklin Engelmann when he visited Grangemouth in a recent "Down Your Way" broadcast. Dr. Livingstone spoke about the development of the dyestuffs and medicinals industry at Grangemouth Works.

in position in a separate box built up from slabs of the foam material. The boxes were lined with white nylon fabric; the cake was wrapped in a special foam-backed fabric; and carefully tailored pieces of flexible foam were used as cushioning material.

The large iced decoration on top of the cake was also snugly packed in foam material, and the three boxes were fixed firmly together and crated. The total weight of the packaging added less than 7 lb. to the weight of the cake.

Good News for Gardeners

Do you aspire to growing prize-winning chrysanthemums? Or do you set yourself the more lowly target of

particularly useful thing for plants such as chrysanthemums, where aphids hide under the folded leaves and it is difficult to hit them with ordinary sprays.

The second point about menazon is its long-lasting properties. Most insecticides are either washed off the plant or decompose within a week or so and fairly frequent spraying is necessary. 'Abol X' goes on killing for up to four weeks. On broad beans one spray will keep blackfly away right up to the time of picking. Roses and other plants need spraying only once a month.

Thirdly, when used as directed, 'Abol X' can be used without harming plants, people or pets.

New ICI Process

THE first commercial unit built by Billingham Division to operate its new synthesis gas process has been successfully commissioned. The plant is at Heysham Factory, where the fertilizer 'Nitro-Chalk' 21 is made in substantial quantities. This development represents an important stage in ICI's efforts to keep down fertilizer costs and prices, and it is with these reductions in cost in mind that ICI has already been able to reduce prices to farmers and to expand its production.

The process is the first stage in the manufacture of ammonia, methanol, fertilizers and other Billingham Division products. It is one in which light oil fractions are continuously reacted with steam over a catalyst at an elevated pressure. Representing a major advance in technology, it has aroused world-wide interest, because it can also be used in the manufacture of hydrogen and of town gas.

Similar units are now being built to replace the coke-based gas plants at Billingham and in the Division's new ammonia plant at Severnside. As these units come into operation the major part of the Division's ammonia and methanol will be produced in this way.

The new process has aroused considerable interest overseas, and to date some thirty contractors and manufacturers from all over the world have sought permission to operate the process under licence.

Mr. Tom McCall

MR. Tom McCall of Nobel Division died in retirement on 13th March. His death is much regretted by the many people who knew him in Nobel Division and throughout ICI because during his 21 years of service he made a vigorous contribution to the success of joint

consultation in Ardeer, in Nobel Division and at Central Council.

For very many years he was chairman of workers' representatives on the Ardeer Works Council, Nobel Division Council and on several occasions on Central Council. In these responsible positions his gifts for quiet yet forceful debate and his ability to recognise new facts and evaluate them were admirable equipment.

The value of his joint consultative work and his devotion to the affairs of the Transport and General Workers Union were recognised when, in the 1954 New Year Honours List, he was awarded the BEM.

Mr. Cooke Retires

MR. E. A. Cooke, universities liaison officer for ICI since 1955, retired at the end of March after nearly 40 years' service. He joined Brunner, Mond & Co. as a research chemist in 1923 and later became deputy research manager of the Alkali Division. In 1946 he was appointed Alkali Division Staff manager and in 1955 transferred to Central Staff Department to take up the newly created post of universities liaison officer.

During his time in this last job he saw a great increase in the size of all universities



Mr. Cooke

and the foundation of several new ones. He paid no fewer than 258 visits to universities, met the vice-chancellors of all but two and nearly 700 professors, readers and lecturers, and toured about 130 university departments. He says that unfortunately this increase in the number of students has not led to a proportionate increase in the number of first-class scientific brains but a depressing lengthening in the line of mediocrities.

Some months ago he was interviewed on television in the course of a feature on

training scientists and technologists for industry. Not surprisingly, his advice has been much sought by friends and colleagues throughout ICI in the choice of universities for their children.

A man of many varied hobbies such as photography, radio, sound recording, gadgets of all kinds, music, caravanning, gardening, the study of geology, meteorology and the countryside in general, Mr. Cooke is unlikely to find time on his hands in retirement.

Responsibility for maintaining his contacts in the universities has passed to the Head Office Research and Development Department. **Dr. M. A. T. Rogers**, assistant head of the Department, is now responsible for relations with the universities, assisted by **Dr. Trevor Williams**, the editor of *Endeavour*.

Russian Order

CONTRACTS amounting to £1 million have recently been awarded to US Rubber International (Great Britain) and BTR Industries for the supply of 22 miles of 'Terylene' reinforced conveyor belting to the USSR.

To be used for opencast mining, this heavy, high-tensile belting, some of which will be 80 in. wide, of a 14-ply construction and up to 1½ in. thick, has been designed to meet particularly stringent Russian specifications. It consists of a 100% 'Terylene' carcass woven from 900,000 lb. of filament yarn supplied by Fibres Division. The cover, reinforced with a nylon breaker, is of a specially compounded rubber for operating within a temperature of 195° to minus 58°F.

This is the fourth order from the USSR for 'Terylene' reinforced conveyor belting. The first was in 1958, when BTR supplied 5 miles of belting, followed in 1961 by two more similar orders for BTR and Dunlop Rubber Co.

Trip of a Lifetime

A 19-YEAR-OLD apprentice instrument artificer at Alkali Division's Wallerscote Works, **Harold Rogers**, has been accepted for a two months' high-speed tour of Canada under the English Speaking Union Commonwealth Youth Exchange Scheme. Harold was nominated by the Division shortly after winning the Fleck Award. He was interviewed by members of the English Speaking Union in London, and was notified of his success on 21st March.

No date has yet been fixed for the tour, but it will take place later this year. The purpose of the scheme is to enable young people to study the pattern of social and

industrial life in countries within the Commonwealth.

Appointments

Some recent appointments in ICI are: **Billingham Division:** Dr. W. R. Bucknall, Distribution Services Manager; Dr. H. S. Hirst, Director; Mr. I. S. McKay, Deputy Distribution Services Manager; Mr. G. H. Payn, Gas and Power Works Manager. **Dyestuffs Division:** Dr. R. R. Davies, Associate Research Manager in charge of the Dyestuffs Group; Dr. H. T. Howard, Associate Research Manager in charge of the Polymer Section. **Head Office:** Mr. A. A. Martin, Deputy Head of Central Work Study Department; Dr. R. J. W. Reynolds, appointed to staff of ICI's Polymers and Petrochemicals Laboratory. **Heavy Organic Chemicals Division:** Dr. K. W. Gee, Production Manager; Mr. J. Grange Moore, Director responsible for personnel matters (in addition to his duties as Wilton Works and Personnel Director). **Pharmaceuticals Division:** Dr. H. C. Carrington, Division Development Director. **Wilton Council:** Mr. J. D. Brown, Dr. C. Cockram and Mr. K. W. Palmer, Directors (in addition to their appointments as HOC Division Directors). **Chemicals and Fibres of India:** Mr. F. W. Harvey, Works Manager designate of new polyester plant.

Retirements

Some recent announcements of senior staff retirements are: **Dyestuffs Division:** Dr. H. A. Piggott, Associate Research Manager (retiring 31st August). **Head Office:** Dr. A. O. Ball, Head of Patents Section (retiring 30th September); Mr. E. A. Cooke, Universities Liaison Officer (retired 31st March).

Obituaries

Mr. H. E. Cocksedge, who was research director of ICI (Alkali) Ltd. at the time of his retirement in March 1941, died on 20th March at the age of 77. Mr. Cocksedge joined Brunner-Mond in 1909. After his retirement he went to live in Hampshire, but continued to maintain a keen interest in Alkali Division activities.

Mr. H. G. Hurst, who at the time of his retirement in 1946 was the Dyestuffs Division personnel director, died suddenly on 23rd March at the age of 80. Mr. Hurst joined Levinstein Ltd. in 1900 and after the British Dyestuffs Corporation was formed he became works manager of Blackley Works. He was appointed to the ICI (Dyestuffs) Ltd. Delegate Board in 1942.

Mr. J. W. Ravenscroft, who at the time of his retirement in 1957 was General Chemicals Division labour manager, died on 6th March. He was 66. Mr. Ravenscroft joined the Castner-Kellner Alkali Co. in 1909 and was appointed General Chemicals Group labour manager in 1930.

Correction

The scale given for the map of the Rozenburg site which appeared on pages 112-113 of our last issue was wrongly stated to be 3½ in. to the mile. This should have been 3⅓ in. to ½ mile.

Back Cover

The record of who took this month's back cover picture has unfortunately been destroyed. The picture is believed to be the work of a member of the Company, and if anyone recognises it as his own, will he please get in touch with the Editor.

THE art of flower arrangement is becoming more popular in all parts of the country. How nice to see this trend and to know that flower clubs and flower arrangement societies are continually being formed. We see the good effect of these clubs not only in the flower shows but in the home as well. As a result gardeners more and more want to grow good flowers and foliage to cut from the garden, not necessarily the huge blooms of chrysanthemums and dahlias six or more inches across, but neat flowers, single blooms or sprays with a good long cutting stem.

Sweet Peas

Sweet peas are among the finest of flowers for cutting during the summer months. It is essential that they should have stems ten or more inches long, and better still if they each have four or five blooms at the end of such a good stem. This can only be achieved by restricting the number of shoots on each plant. The side shoots which form in each leaf joint must be rubbed out and the tendrils from the end of the leaves removed to concentrate all the energy of the plants into the production of good flowers. Regular watering is necessary whenever the weather is dry, giving enough to soak right down to the roots, and once a week adding to the water a high potash fertilizer such as 'Solufeed' at the rate recommended by the makers. The flowers must never be left on the plants to produce seed, otherwise flowering will soon cease. Always cut sweet peas before the top two flowers

on the stems are properly open. If you put them into deep water for an hour or two before arranging, they will last a lot longer.

Gladioli

Gladioli come into their own for cutting from July onwards according to variety. The primulinus and butterfly types are neater and better for floral decorations than the large-flowered gladioli. Corms planted this month (and I am sure there are still some being offered for sale) will flower in the late summer and early



autumn. As the plants grow they must each be given the support of a cane or stick, otherwise they are likely to be dashed by wind or rain and the flower spikes will be crooked; the tops will turn up to the light in a matter of hours. Gladioli for indoor decoration should be cut as soon as the first flower at the bottom of the spike begins to open. Like sweet peas, these too should be put into deep water in a cool place, preferably overnight,

before they go into the arrangement. If they are needed for a flower show it will be necessary to cut them at least three or four days before the show.

There is no need to disbud all the roses if you want to cut them. Some can be disbudded so that there is one fine flower on each stem, and others left to form sprays; they are so much more useful this way. Roses should be cut when in a close bud and put into water overnight. When the first blooms of the roses are beginning to fade, feed the bushes with an organic-based fertilizer such as 'Plus' and water them to help along the secondary growth and flowers. Strong rose bushes will often continue to flower until November if the weather remains open.

Chrysanthemums

There is no necessity to disbud all the chrysanthemums either. Many of these can be left to form sprays for use in bowls and vases. The Otley Korean and Windsor Hybrid chrysanthemums form neat compact plants covered in double or single flowers and are ideal for cutting. It is still not too late to plant them in the garden for autumn flowering.

During the summer months never cut flowers from the garden when the full sun is on them; cut when they are at their freshest and best, early in the morning or late at night. Have a bucket of water handy and put the flowers in as soon as possible. Woody stems can be crushed at the base to help them to take up the water and so last longer in the house.

To Hell with the Garden

by Cedric B. Shipley

THE poet who piously wrote that "one is nearer God's heart in a garden than anywhere else on earth" must have been a very lucky man indeed. Maybe he knew Percy Thrower and had the run of that green-fingered gentleman's flowery kingdom.

I can't see anyone who's kept a garden getting such poetical inspiration and producing such gushing verse. Surely he has not had the painful experience of being unable to straighten his back after weeding interminable stretches of border. His hands can never have experienced the agony of scratched and bleeding hands when endeavouring to pick blooms from such harmless-sounding rose trees as "Peace" and "Mrs. Miniver." Do the rays of the scorching sun really bring "kisses of pardon"? And are those sparrows, gorged on newly sown seed, really singing a song of mirth? If they are, they're laughing at me. I'm jolly glad that that poet didn't write a cat into his garden ode. How the heck can you feel lyrical when next-door's cat is engaging in its pre-toilet excavations just where you've sown the sweet peas?

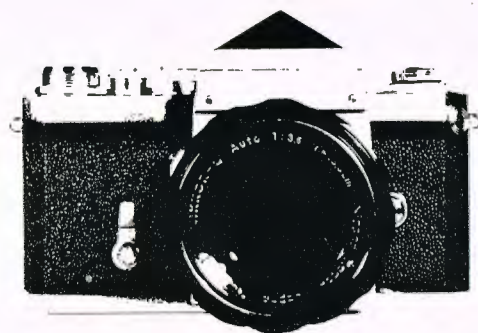
The life of the gardener is just one long toil from dawn to dusk. Every morning there must be a tour of inspection to assess the damage caused by the nocturnal perambulations and excavations of cats and other prowling creatures of the dark hours. Even at work, in the office or at the workbench, the gardener is hard at it, endeavouring to persuade his fellow toilers (and himself) that gardening is so "terribly worth while."

When the gardener returns at the end of the day to "Chez Nous" or "Mon Repos," his eagle eye takes in the scene, and when he enters the house there's no cheery greeting, only "Who's been trampling all over my flower beds?" Tea no sooner over than the gardener must be out, answering the call of his mistress, weeding, hoeing, raking, mowing, till darkness brings merciful relief. Relief? There's no relief for the gardener once the deadly disease has him in its grip.

Even after darkness has fallen in the garden there'll be cacti and indoor plants clamouring for attention. Then the seed catalogues will be read and re-read and orders despatched for next year's seeds. There's nothing poetical about the poor slave of the garden as his devoted and long-suffering spouse leads him aloft to his bed, to dream of—gardening.

Gardening changes a man's character. Once set on the Garden Slave Path a man loses his innocence, he becomes a snarling, lying maniac. Let some poor unfortunate child or animal step from the strait and narrow way, and he begins to rave and swear. No temple is more sacred than that rose-bowered precinct, no shrine more hallowed than that lush emerald turf. And as for lying, fishermen are in the kindergarten compared to the fanatical gardener. His garden possesses magical properties, causing turnips to grow as big as buckets and Brussels sprouts as big as your fist, and as for his dahlias and gladioli—well, they can't grow bigger or better ones, even in Texas.

Don't talk to me about gardening!



Home and Overseas



Wilton's royal visitor. Princess Margaret made an informal visit to Wilton Works on the afternoon of 10th April after she had opened a cobalt "bomb" unit at a hospital in Middlesbrough a few miles away. *Opposite:* The Princess signs the Wilton visitors' book. *Above:* Watching 'Terylene' being manufactured.

With her are Dr. J. Y. Baxter, 'Terylene' works manager (*centre*), and Mr. M. Bullock, a process operator. *Below:* entering one of the restaurants on the Wilton site with Mr. R. A. Banks, ICI Group D Director, for afternoon tea





Praise for Cassel men. Members of Cassel Works, Billingham (General Chemicals Division) B shift, whose action after an explosion on the Hydrocyanic Plant on 31st March won high praise. No one was injured by the explosion, and the fact that there was no subsequent injury to personnel is a tribute to the calm and efficient way all those concerned dealt with a dangerous situation. Fire followed the explosion and, because the hydrocyanic acid gas which ignited was poisonous, the fire was allowed to burn under control for some time as the safest way of disposing of the gas



One against twenty. Twenty players from Ayrshire chess clubs met in the Ardeer (Nobel Division) Recreation Club recently to match their skill against that of Mr. William Fairhurst, chess correspondent of the *Glasgow Herald* and a former Scottish champion. In a simultaneous match Mr. Fairhurst lost only one board. His successful opponent was Mr. Michael Webb, one of five Ardeer men taking part



Secretaries in the news. Miss Yvonne Cary (European Council) was one of four ICI secretaries interviewed by John Timpson on BBC TV's *Town and Around* programme on 22nd March. The programme followed national press publicity about the shortage of good secretaries and the special courses now being run for potential personal secretaries. ICI is one of several companies which run their own courses. The four secretaries were asked why they thought there was a shortage and what hints they would give an employer on how to keep a good secretary once he has found one



Expansion at Shelby. The Stars and Stripes and the Union Jack fly together on the Fiber Industries 'Fortrel' Plant site at Shelby, North Carolina, on the occasion of the recent meeting of the board of directors. Plans for the expansion of Fiber Industries Inc., jointly owned by ICI and the Celanese Corporation of America, were announced in March which will give the plant over 400,000 sq. ft. of floor space and will almost double the production of the raw material from which 'Fortrel' polyester fibre comes



Cold feet. This young lady seems to find acting as photographer's model for dad a rather chilly business. The photograph, by Mr. Arthur Jones (General Chemicals Division), got into the short list of the *Daily Herald's* holiday photo competition and has appeared in an exhibition the newspaper put on in London, and Ilford Ltd. have also used it in one of their exhibitions



£408 award. Smiles all round as Dr. R. G. Heyes, Plastics Division production director, presents cheques to joint Suggestion Scheme winners Mr. A. E. McKay (left) and Mr. J. G. Rae. Their idea, which has won them £408, will result in a saving of between 70 and 90 tons a year of latex on the 'Corvic' Plant

DOES THE REFEREE GET A FAIR CRACK OF THE WHIP ?



Kevin Howley, who gives the referee's viewpoint on soccer problems, fought his way step by step to the top of the referee ladder. He refereed the 1960 Wembley Cup Final.

ONCE again in the season just finished we have seen that much-maligned body of men, the referees, coming under fire from club managers, players, public and the press. For the past five or six seasons this abuse hurled at referees has gathered in momentum. Yet English referees are still regarded by the continental country and club officials as the best in the world. Hence the demand for them at international and European Cup games abroad.

Obviously mistakes have been made, and will continue to be made. When it comes to making a decision, the referee cannot wait until the papers are printed. He has to decide there and then. The referee's decision is given in all honesty, and I'm sure that if the managers, players and public would spend some time with an FA chart they would appreciate at least some of the anomalies that can and do occur in football. Too often the referee is damned for one decision which will have been termed as a harsh award or a borderline case. The fact that he has controlled the game for 90 minutes won't be considered. Oh no!—just that one



Wembley Cup Final, 1960. Wolves are attacking the Blackburn goal. The author, who is refereeing the match, is just behind the Wolves forwards

decision that the grandstand eagle eyes didn't agree with.

Of course, on occasions these people are right in their interpretation of what happened. But does all the ranting and raving make things any better? Of course not! The referee considered he made a correct and honest decision, and that decision will stand, as far as the Football Association and Football League are concerned.

How are FA Officials Chosen?

Up and down the country are county FA committees who control the local football leagues in their particular areas. They, together with the Referee Association,

recruit referees to handle the games in the various youth and district leagues. These local FA officials are to be seen every Saturday covering one match or another, and from their reports the referee is graded. If his ability warrants it, they will recommend him to be included on a senior professional league, such as the Central or Southern league or the Lancashire or Birmingham combination. The referees in these leagues have the dual role of Football League linesmen. If the marks from the clubs concerning a referee are favourable, he is recommended to be included on the Football League list of referees. The road to the top is a long one.

Once on the Football League, how do you stay on, or come off the list?

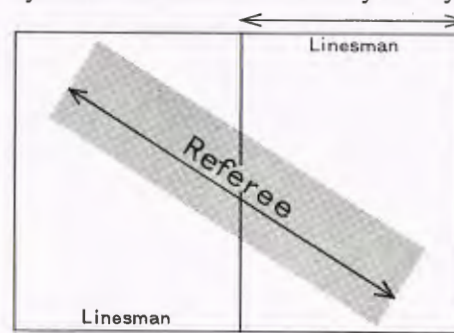
Every Football League club has to mark the referee's rating on a special form. After the game, the two clubs concerned independently make an assessment. They have four points each, and what they decide on is forwarded to the Football League. These reports are then collated. At the end of the season the referee is expected to attain a percentage of 65% or, to put it another way, 5 from every game out of a maximum of 8. I might add that quite a lot of people do not agree with this system of club marking, but, as yet, no other practical alternative has been thought of.



The referee is chased from the field by angry spectators in a football match at Foggia in southern Italy

Why do linesmen only patrol one half of the field?

This routine is known as the diagonal system. The sketch will show you why.



With this system you will see that at all times at least one official will be level with play at any one particular time, even if the referee is left behind by quick up-field clearance. If you study the illustration, you will see that this system gives the officials the best possible coverage, irrespective of any sudden change in the game. It is shown at its best with regard to offside decisions. The placing of the linesmen is perfect for judging these cases.

Would it be better to have full-time referees?

I can make out a good case for and against a full-time referee. I do think, however, that the case for not having them is the stronger one. To be full time, a referee would need some form of contract. Retiring age for referees is now 47. Coupled with the fact that they don't on an average reach Football League status until the age of 36-38, this means a very short career—too short to be attractive to a really good man.

Even if the ruling bodies were to increase the age limit to 50, it would be tough going for a referee until the day his old age pension is due. On top of that, how would we referees spend our time between games? You may say training with the players of your local Football League club. That would only be about 10-15 hours per week. We could also give lessons to players on the laws of the game. That I would heartily agree to do. But we would still have a lot of time on our hands. Finally, how would we be paid? By whom? And what would our wages be?

I'm afraid there are too many snags. Do you honestly think that men of the calibre of Reg Leafe, Arthur Ellis, Jack Clough and other star referees would have been better if they had been full time officials? The answer must be NO.

At present referees are completely independent of football. We have a job outside the game and an understanding employer who allows us time from work to follow what is, after all, a remunerative hobby. We get a fee of £7 7s. for a Football League game, plus meal and hotel allowances (taxable). I consider that to be very good part time earnings for doing a job we love to do.

I have tried to give an insight into the workings of referees, and at the same time be fair. But considering the way our human failings are magnified and the good we do to the game is minimised, my conclusion must be that we do not get a fair crack of the whip. I must add, however, that we as a body recognise that we are a natural target for spectators and for my part I thoroughly enjoy the roar of the crowd and get many a good laugh.

ICI's Newest Fibre

PLASTICS Division's 10,000 tons a year plant came into operation last year to make 'Propathene': now Fibres Division's 5 million lb. a year plant to make 'Ulstron' multifilament yarn has started up. What are its advantages, and where is it being used?

Polypropylene fibres combine strength and toughness with lightness and low water absorption. ICI's polypropylene, incidentally, is stronger than anyone else's and, moreover, it is inexpensive. Now it is clearly impossible to introduce 'Ulstron' everywhere at once: there is just not enough to go round. So Fibres Division has aimed first at those uses where polypropylene has most to offer, in fishnets and ropes. In these forms it has the edge over all its competitors. Not only is it the lightest fibre ever known—its specific gravity is 0.91—but it is extremely strong, is tougher than nylon, absorbs less water than nylon and combines in one fibre the acid resistance of 'Terylene' with the alkaline resistance of nylon.

Most of the 'Ulstron' multifilament yarn sold to date has been for fishnet twine. One of Britain's largest trawlers, fitted out with 'Ulstron' netting, radioed back that it was performing exceptionally well, while from the other side of the world a Fisheries Officer from Africa, with many years of experience with synthetic gill nets, wrote: "From the results obtained 'Ulstron' is a definite improvement on the best nylon in the world: not only does it last longer but it catches more fish per fishing day, and the manufacturer states that the cost is less than nylon." The extreme lightness of 'Ulstron' also means another useful saving: fewer pounds of twine have to be put into a net to get the same coverage as with other fibres.

Many other uses are also being investi-

gated. The start-up of the pilot plant last August—exactly a year after the agreement with Montecatini had been signed—enabled other commercial trials to be undertaken. Apart from associated uses such as tennis nets, industrial safety nets, netting for fruit packaging and other agricultural uses, one of the most encouraging applications to date has been in conveyor belting. Although high temperatures are used in the manufacture of belting—and one of the limitations of polypropylene is its melting point of 165°C—the indications are that speciality conveyor belts using 'Ulstron' as the base fabric can be satisfactorily produced. 'Ulstron' cannot yet be bonded directly to rubber or PVC by chemical means, but adhesion can be obtained by the incorporation of cotton in the base fabric construction. Successful development may well open up possibilities in tarpaulin-type industrial fabrics and in the industrial hose field, where it may be particularly suitable for braided yarns.

So far we have talked about multifilament applications. What is happening with monofilament and staple fibre? Monofilament polypropylene is at present being produced by Fibres Division only on an experimental plant, and its output is being used for evaluation in various applications, such as fishnetting, ropes, interlinings, zip fastener tapes, dolls' hair and so on. A type of monofilament polypropylene, which will not be called 'Ulstron,' is being produced by Fibres Division for Plastics Division, who are investigating its use for bristles, pan scrubbers and other similar articles. Results here are very encouraging: it will compete strongly with nylon for pan scrubbers, and in bristles it will enlarge the available market by attacking the cheaper end, where natural fibres are

On 31st August 1960 ICI signed an agreement with Montecatini of Italy, giving ICI the right to manufacture and sell staple fibres, filament yarns and textile monofilaments made from polypropylene. The new fibre, now on the market, is called 'Ulstron.'

Contributed by Fibres Division

still being used because of their price advantage.

You may be wondering when any mention is to be made of clothing and household textiles produced from polypropylene. These are uses which are also under investigation, and when clothing is available which incorporates polypropylene, it will probably be the staple fibre form that is used. The advantages here are relative cheapness, lightness and good bulking quality, strength and quick drying; one outstanding characteristic is that it does not pill. There are admittedly some problems. One is the low melting point; another is difficulty in dyeing, on which good research progress is being made.

Of particular interest in this field are its possibilities in blankets, carpets, pile fabrics and scatter rugs. Blankets are likely to be on the market by the end of this year at prices cheaper than other synthetic fibre blankets. They will also be lighter, more stable dimensionally and be easier to wash. Overalls are already in use by chemical workers, and other garments in polypropylene are likely to be of the jersey and other knitted types. Fur fabrics should also be among the leaders.

It will be seen even from this brief review that there is a big future ahead for 'Ulstron' in a wide number of applications—in some cases opening up fields not hitherto possible with 'Terylene,' in others replacing nylon because of its wider chemical resistance, or polythene because of its greater strength. In many instances it will replace natural fibres in applications where other synthetics were uneconomic on a price/life basis. In all cases it will be helping the end user to get something more durable, more efficient, safer or cheaper.



Sisal

The cheapest rope on the market but also the poorest for wear and tear. The 3 in. circumference rope photographed above has the same breaking load (4½–5 tons) as the 'Ulstron' rope which is only 1¾ in. in circumference.

'Terylene'

A much tougher rope than one of natural fibre but more expensive, of course. A 2 in. circumference 'Terylene' rope has about the same breaking load as the other ropes pictured here.

'Ulstron'

On a price-life basis 'Ulstron' is cheaper than any other marine rope, even of natural fibre, since it lasts so much longer. It is also much lighter than 'Terylene' or nylon, which makes it easier to handle. In fact it is so light it floats and so can't get entangled with the propeller.



Nineteenth-century print of a Loch Leven trout

Fertilizing for Bigger Trout

by Harry Hutchison

As the long evening light slopes over the hills to stain the smooth waters of some highland loch, the brown trout rise to take the angler's lure—lusty sporting brown trout, weighing anything from half a pound to a pound, and even more. This is the hope that sustains the angler. All too often it is a highly coloured picture not related to reality—a picture that is just another angler's dream. Much more often than not, and certainly more often than need be, the fish he will catch won't turn the scale at more than four ounces. Sometimes they will just be thrown back into the water as too small to take.

Some lochs are rich in the number and quality of their brown trout. Why then should other lochs be poor and disappointing, despite much money spent managing and restocking? This is a fascinating problem to which some of the answers are now known, thanks to scientists of the Freshwater Fisheries Laboratory near Pitlochry, Perthshire.

Too Little Food

Fish are herbivorous or carnivorous, just as animals on land browse or eat flesh. And as with animals, when food is plentiful they grow bigger and multiply. But when too many trout compete for too little food, those that survive fail to thrive. That is why the brown trout in Loch Leven may average a pound in weight, whereas those caught in far too many highland lochs will turn the scale at only four ounces. Why, indeed, are the Loch Leven trout so much healthier and

bigger? The answer is simple. Loch Leven is a large and comparatively shallow loch, surrounded by agricultural land, and its waters are reasonably hard. Into Loch Leven go fertilizers that leach from farmers' fields and there is also some sewage, all of which enriches the plant and animal life of the waters.

How then can impoverished lochs be made to support brown trout more like those of Loch Leven?

Farmer's Approach

Scientists tackling this problem look at it in much the same light as a farmer looks at his ground. A farmer will determine the nature of his soil and apply fertilizers so that obvious deficiencies can be made good. He applies the right kind of fertilizer, and the productivity of his soil is increased.

The situation in a highland loch is broadly the same. The loch maintains a complex population of living plants and animals, each of which reacts upon the other. It is not easily possible, therefore, to treat the loch in such a way that only one species will benefit. It is necessary so to enrich the loch that a general reaction is started which ultimately will provide more of the right kind of food for the brown trout. Experiments on several selected small lochs show that application of mineral fertilizers has a positive effect on the growth of the brown trout. That was the news given to me when I visited the Freshwater Fisheries Laboratory at Pitlochry six weeks ago.

It was a clear, cold day, with a nip in the highland air; and the attractive prospect of man-made Loch Faskally was an admirable outlook from those laboratories in which so much important work is being done. The laboratories are near Pitlochry, a central point in one of the largest hydro-electric undertakings in Scotland, which at many stages makes use of the water of the rivers Garry and Tummel that drain an area of nearly 700 square miles. In the laboratories, senior chemist Mr. A. V. Holden spoke enthusiastically of the possibilities, emphasising as he did so that as leisure increases, so will the demand for brown trout fishing.

Trials in Three Lochs

The first notable experiment done by the laboratory was in three lochs in the Tummel-Garry area, to whose water minerals in different forms were added. The scientists studied the chemistry of the operation and the degree of persistence of the fertilizers on the bottom of the waters. In particular they noted the botanical changes encouraged by the fertilizers. They found that there had been almost a thousandfold increase in the population of algae. They noted, too, that further improvement could be effected if the acidity of highland lochs were reduced; but in order to do so, an enormous quantity of calcium carbonate would have to be added. Although tried on a very small scale, this was not thought to be practical in large lochs, because of the expense involved. It was felt, however,

that examination should be made of the other nutrient deficiencies in highland lochs—deficiencies in nitrogen, phosphates and potassium.

For a variety of reasons, nitrogen and potassium elements were found to be of less importance than phosphates. In the average highland loch, the quantity of phosphate present was below the level of detection, about one part per billion. But in Loch Leven, for example, where the trout are large and other factors in the loch life are equally encouraging, there is a phosphate level of up to 50 parts per billion in the water.

Superphosphate Deficiency

The addition of superphosphate to deficient lochs can give a big improvement with a phosphate level less than Loch Leven's figure. A much lower level will stimulate increase in the number of bottom fauna, shrimps and water snails, larvae of insects, and so on, on which the carnivorous brown trout feed.

The second series of experiments confirmed the findings of the first. Four lochs in west Sutherland (Smuraich, Grosvenor, Daimh Mhor and Beiste Brice) were fertilized and observations made on the average weight of two- and three-year-old brown trout before and after. These were compared with results in the untreated control loch Mhullaich. The age of the trout measured, weighed and returned was determined by scale examination.

At the start of this second series of ex-

periments, two-year-old trout in Smuraich averaged 2.4 oz. in weight, whereas two years later the average weight for two-year-olds had risen to 5.2 oz. and in the following year had fallen slightly to 4.9 oz. Three-year-old fish, which had an average weight of 4.2 oz. at the start, gave an average weight of 7.4 oz. two years later and an average weight of half a pound three years later. In the unfertilized control loch, the average weight of two- and three-year-old trout fell.

From such experiments and more, scientists at the Pitlochry station concluded that application of a mineral fertilizer would increase the productivity of small lochs by stimulating vegetable growth and, in chain, growth in the animals that feed on the vegetation followed by growth in the trout.

Thirty Shillings an Acre

Fertilization of a large, deep loch can be a costly business. But in the case of small, comparatively shallow lochs, whose feed waters and exit waters flow at such a rate that change of total loch water occurs perhaps only twice or three times in a year, the proposition is much more reasonable. Mr. Holden mentioned about 30s. per surface acre as an approximate figure, so a 35-acre loch would cost an angling club or owner about £50 to do the job.

Often when angling clubs or owners decide to improve the fishing quality of their lochs they restock with one-year-old and two-year-old brown trout. The one-

year olds cost about £40 a thousand and two-year-olds rather more than twice as much. Far too often this does not bring the expected reward, because the new fish, instead of improving, die or lose quality. If the original fish in the loch are in poor condition, and probably already too numerous for the available food supply, the arrival of the fresh stock makes matters worse.

"Very often the money would have been better spent in fertilizing the waters," said Mr. Holden, who emphasised, however, that local conditions should always be examined.

Five-year Programme

The fertilizer, preferably in granular form because "dust gets in the eyes," is easily enough applied from the back of an outboard motor boat, the propeller giving good dispersion and spread in the water as the boat cruises over carefully measured areas. The rate of application of superphosphate is about 1 cwt. per acre annually for two years. This will usually make good deficiencies for five years in all, when a further two-year programme of fertilizer application should be undertaken. Fertilizer dressings on this scale should enable the loch to carry either a greater stock of trout or much the same stock of larger trout.

And what about future experiments at the Pitlochry laboratory? The latest experiments concern salmon, but they have not yet been completed and there are no published conclusions.

CANAL CRUISE

by Philip Ackroyd

In March last year the *Magazine* carried the story of a canal cruise in a converted ex-airborne lifeboat. Two people read it with more than ordinary interest.

SEVERAL recent *Magazine* issues have been opened in our household with some misgiving. Not for us the delights of owning such trifles as old watches, horse-drawn caravans, snuffboxes and light railways. Our apprehension will be understood when I explain that one subject of the *Magazine* for March 1961 has since absorbed so much of our spare time, and cash, that no competitor can be tolerated!

This particular issue included an illustrated account of canal cruising in a converted ex-airborne lifeboat. I showed my wife the pictures with the comment, "Doesn't this look attractive?" to which she replied "Yes; why don't *we* do it?" Just like that!

It was Wednesday, 22nd March.

The following Friday, glancing at the ad. columns of the *Manchester Evening News*, I noticed under "Motor Boats, Yachts, etc." the entry "17 ft. fibreglass cabin cruiser, 2 berth, galley, sep. toilet, trailer, Tel. Liverpool No. . . ."

In a somewhat impetuous telephone call we arranged to see it the next afternoon.

We spent the morning rushing round local boat dealers and station bookstalls in almost frantic research on boat sizes, prices and values. At that time we hardly knew a transom from a hansom. After lunch we met the owner and saw the boat on its trailer in the garden—miles from any water. Of course we bought it—as he said, "You can see it's quite genuine—I'm only selling it to buy a bigger boat—it's just the thing to start with."

The purchase of an outboard motor, secondhand from the same ad. column, and the viewing of facilities at two cruising clubs completed a very full weekend. A week later we had joined the nearer of these clubs, bought a club burgee (this, I found, was a little triangular flag), paid for mooring fees, a canal licence, some strongly advised insurance and a lifebelt. We were in the business with full equipment, ready to go!

Mooring lines and boat hook had been thrown in with the deal for the boat, which was in spanking condition, used only two seasons as a day boat on the River Dee, but we were not so lucky in our choice of motor. In "mint" condition, this, I found later, was a new and relatively untried design.

It was responsible for our thorough knowledge of navigation procedure following several mechanical breakdowns.

Fortunately, on the canals, dry land is never far away.

Even the day of launching did not proceed without incident. It took place in April at a slipway some $7\frac{1}{2}$ miles from our new club moorings. Petrol pump trouble one mile from home provoked a succession of perilous situations and the cry of "Man overboard!" At the ceremony an hour before our boat had been named the *Philyda* by my wife, but it cannot truthfully be stated that her proper title was included among the choice words uttered then.

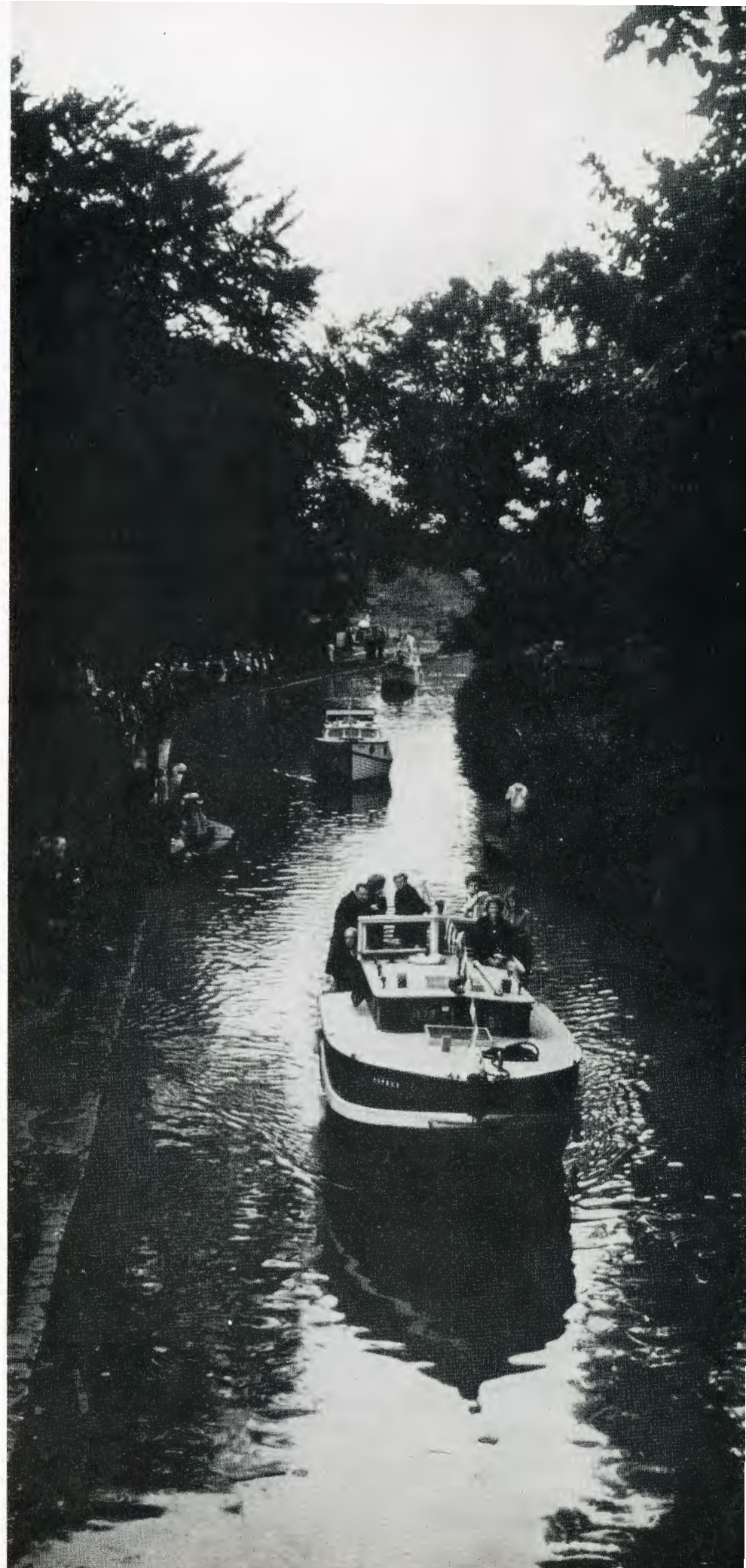
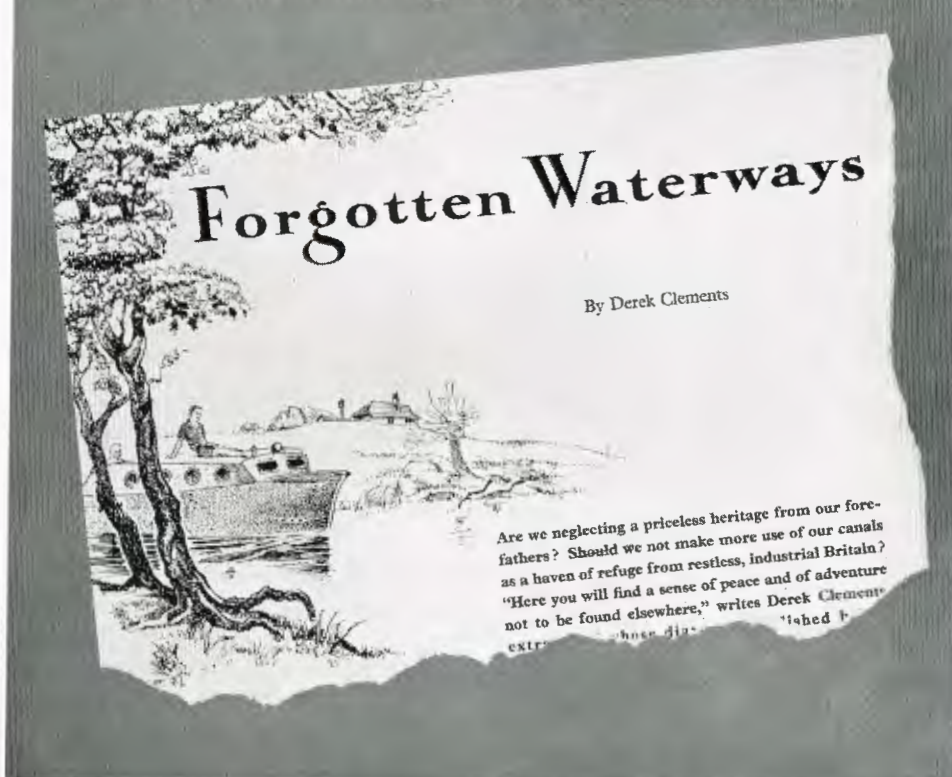
The worst lapses occurred at most inconvenient times. The last of any consequence was at the rally of over 100 boats for the Bridgewater Canal bicentenary celebrations at Worsley in July. All craft attending the rally were presented with handsome inscribed enamel bulkhead plaques, but, thanks to a broken valve, *Philyda* has the honour of being the only boat which covered part of the journey under the original method of canal propulsion—one manpower, at the towpath end of a rope attached amidships!

Our luck seemed to change after that episode. We have since enjoyed virtually trouble-free cruising in a variety of trips, including a six-day summer cruise when we lived aboard. On five different canals we penetrated as far away from Manchester as Nantwich, navigating numerous locks and bridges, three tunnels, and the famous Anderton Lift. This outsized lift took us down some 50 feet from the Trent and Mersey canal on to the River Weaver, where the ICI boats sail majestically by—to our great relief without the sort of wash to worry our little craft.

Any semblance of dignified passage down the Weaver, however, was rudely shattered at Saltersford lock, the first professionally manned lock through which we passed. Here we glided up to the gates under the watchful eyes of lock-keepers. On the command "Fenders Down!" the youngest member of the crew, by this time almost expert in the operation and possibly a little too self-confident, tripped up over the boat-hook and slipped gracefully over the side. Fortunately, as drilled, she managed to hold on tightly to the handrail on the cabin top and got wet only up to her knees, dissolving in helpless laughter.

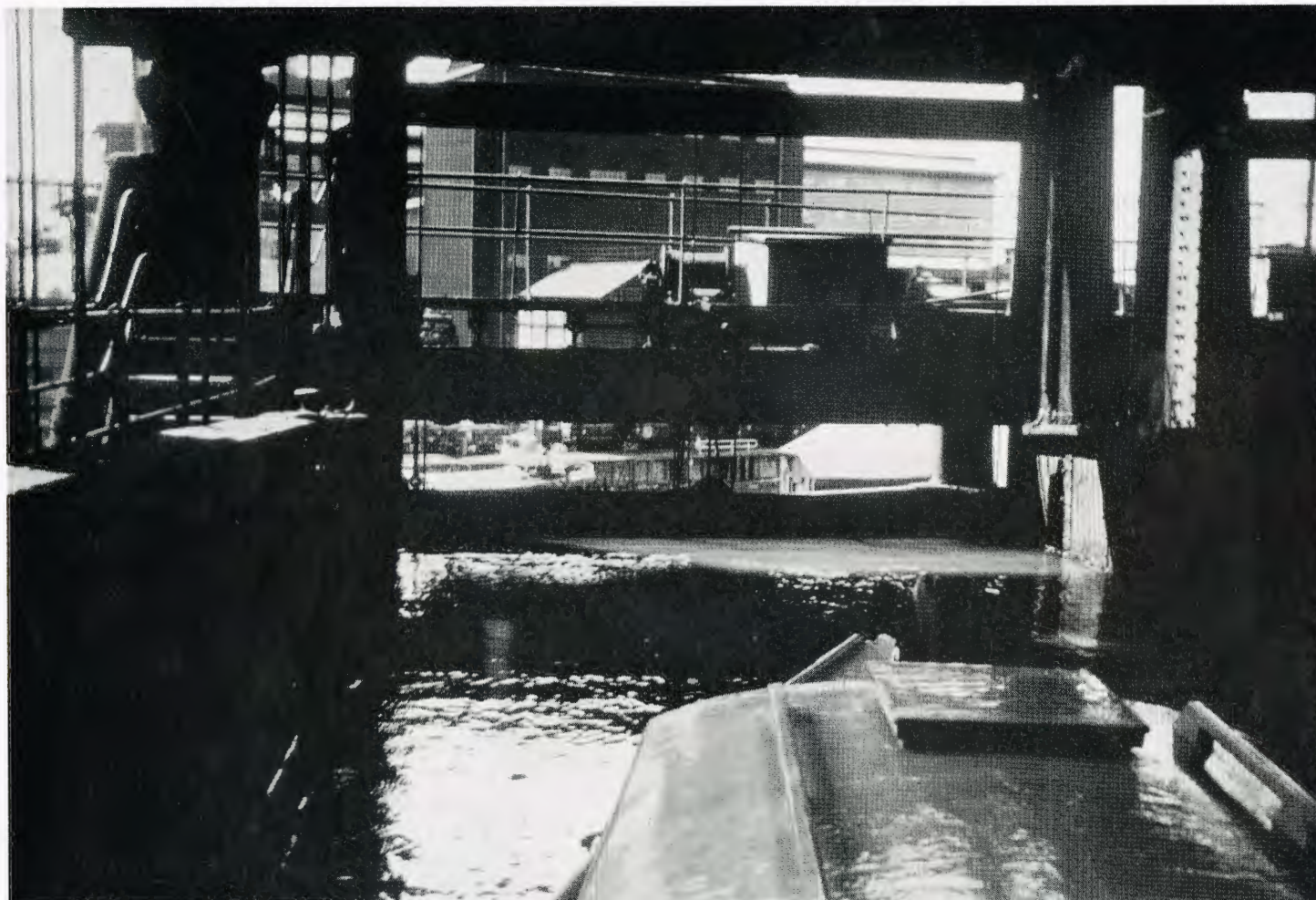
On the "cut" telegraph we had been

The page from the magazine that started it all . . .





Peaceful waters near the Cheshire village of Dutton. The author's wife and daughter take it easy cruising on the Trent and Mersey Canal
BELOW: Going down in the Anderton Lift—midway between the Trent and Mersey Canal and the River Weaver



warned to be clear of that stretch of the Trent and Mersey Canal which encloses the Anderton Lift by 5 p.m. on our sixth day out, as draining operations for bank examination were imminent. This we did with such a comfortable margin that we decided to spend the time on the River Weaver, Runcorn Canal detour, quite oblivious of the repairs in progress on the magnificent eight-lock staircase by means of which we had hoped to regain the Bridgewater Canal level and home waters.

Eventually, as we were just about to open the last and heaviest swing bridge, a lorry driver told us that the flight of locks beyond would be out of commission for at least another week!

It was no consolation to find that another cruiser drawn up alongside was in the same predicament. Further progress was impossible, due to the lock repairs; nor could we go back and up the Anderton Lift, as the Trent and Mersey Canal section at the top would be drained and unnavigable by the time we got there.

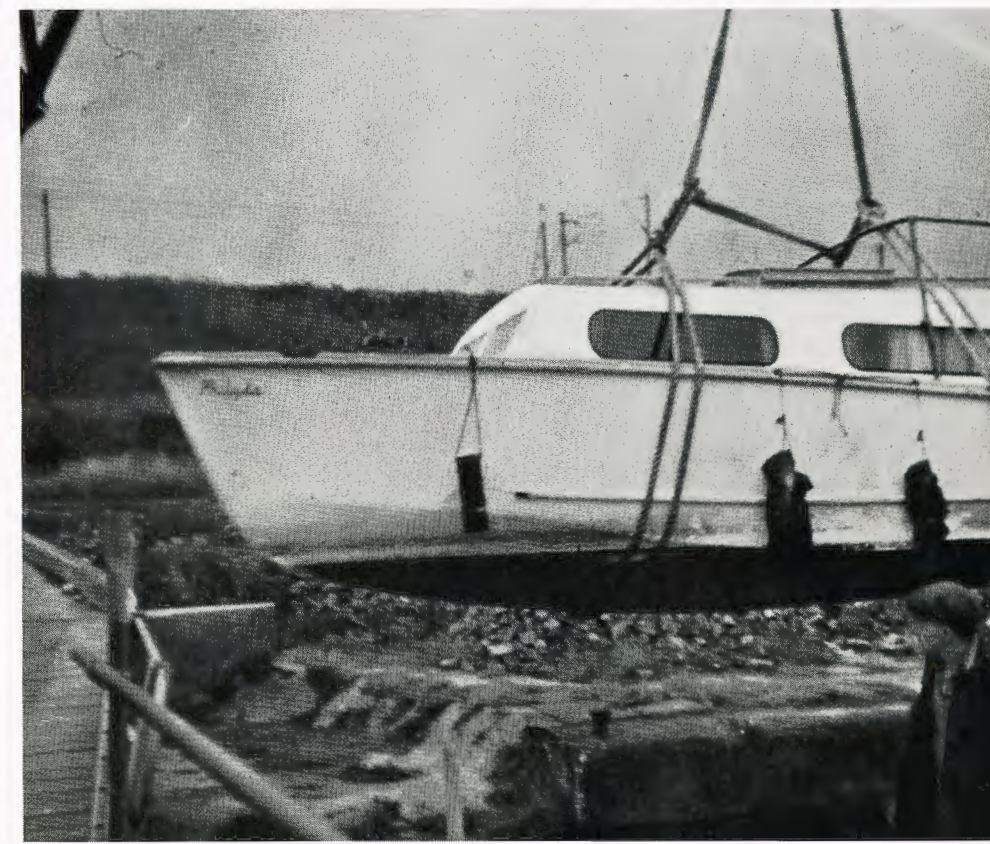
Good fortune had not deserted us entirely, however, as full dock facilities were only yards away. We arranged to have the *Philyda* lifted from the water next day, and I went home on the train to bring up the car and trailer. Transfer to the trailer took two experts with rope slings and mobile crane no more than ten minutes. Our canal holiday ended on the road to the slipway to put the *Philyda* back in the water where she had gone in some five months before. All of which goes to show that, although bigger boats may be more comfortable, you can't beat a little one for getting around.

We learned many things on our first season that had nothing to do with handling a boat or a temperamental two-stroke, such as the ability to see all of the ever-changing countryside gliding by at 5 m.p.h., or to contemplate from the water wild-life invisible from the tumultuous roads. More than anything else we learned something of that wonderful camaraderie which exists on and around the canals—from the lock-keeper's wife who, unasked, supplied free our lack of cooking salt and accompanied her gift with an enormous bunch of flowers from her garden, to the cheerful old pensioner who not only let us replenish our drinking water at his canal-side cottage but conferred on us the freedom of his steaming bathroom as well.



The approach to Wardle Lock, Middlewich, the junction of the Shropshire Union branch canal with the Trent and Mersey. Here the lock-keeper rushed from his cottage to ensure our safety in the turbulent waters filling this deep lock

Journey's end on the Runcorn-Weston Canal. Transfer to the trailer took the two experts with rope slings and mobile crane no more than ten minutes



Notice in the Window by Gordon Long

ONE of my most vivid recollections of boyhood days in Glasgow—and it is by no means the happiest—is traipsing round our local shops with my mother on Saturday mornings.

So far as I was concerned, the slow perambulation was a dreary business in the extreme. I must say I *hated* it. But there was one shop that really *had* some thing to interest me.

This particular shop, which drew me like a magnet, was devoted to the sale of brushes, paints, and all the other requirements of the amateur artist. It seemed that our town boasted quite a number of such people. The shop also made something by selling prints of the great masterpieces and by trying to sell the rather indifferent efforts of our local artists. A pound was a large sum to pay for one of these: for the most part, as you could see by the labels of stamp paper stuck on the glass, they were generally to be had for as little as ten or fifteen shillings. I cannot say I had much time for them. What really took my eye, kindled my imagination and drew me irresistibly away from my mother's side, was the big picture that always occupied pride of place in the centre of what was a large window. The contents of the window might for the most part remain static except for this big picture. It was changed every week. So far as I can remember, it always featured deeds of daring. For example, it introduced me to the grim—but intensely gratifying—sight of great French men-o'-war going down in smoke and flame off Cape Trafalgar with Nelson's triumphant ships standing off. There, too, for the first time I saw the Light Brigade making their immortal Charge at Balaclava.

But there was something else that was always in the window and always intrigued me. It was a small notice in a neat little frame, the words written in letters of gold on a brown background.

However the other contents of the window might change, this little frame with its notice was always there. The notice read "Millions Now Living Will Never Die." The more I looked at it week after week, the more it fascinated me.

What did it mean? I must have turned the words over in my child-mind a thousand times without ever coming to a wholly satisfactory answer. It was about this time that I lost a much-loved grandmother. It had been my first contact with death, and the experience had shaken me rather badly. The thought of an untimely end overtaking either my father or my mother had begun to dominate my thoughts and to keep me awake at nights. You might say, therefore, that the little legend in the frame had an almost morbid interest for me. But I did not discuss it with anybody. I felt it would be too embarrassing, and among adults it might even provoke patronising laughter. Eventually, and working it out for myself, I decided that it meant that there was no real death—not to a Christian, anyway. To a Christian believer death was only a beginning to a new life. Having decided that this was the real burden of the message, I was able to get it out of my thoughts for a short spell, anyway.

One day, however, it came back, and this time the question that it posed loomed more challenging. I must explain how it happened. My mother's birthday was approaching and I was at a loss to know what to give her. I only knew it must be something different. As it happened, I had quite a large sum of money in my red pillar-box at that time—10s. 6d., to be exact. I had saved it up in order to buy the smallest of the Brownie box cameras. But on this particular morning, breaking away from my mother's side, I saw a small watercolour in my favourite window which I liked immensely, and the price tag on it was exactly 10s. 6d. It was more—very much more—than I had intended

to spend, but I decided that I could postpone the pleasure of owning a camera in order to present my mother with the picture. So on the following Saturday, having emptied my money box, I entered the shop for the very first time in my life, and for the first time I saw the man whom I presumed was its proprietor.

He was an elderly man with a shock of white hair and bright, darting eyes. I think he was mildly amused to see me. Such a young customer must have been quite a rarity. He extracted the picture from the window, set it on a convenient shelf, and showed me how, by standing back from it, you could see its qualities to best advantage. I said I would take it and tabled my money. So he wrapped it, patted my head and began showing me to the door. It was at this moment that I realised the chance was presenting itself to me—and might never come again—to resolve the real meaning of the message for all time.

"Sir," I said, "what does the golden message mean in the black frame?" He countered with a question himself: "What d'you think, ma wee laddie?"

What I told him gave him pleasure, for he patted me on the back and laughed heartily.

"Good for you, laddie," he said; "but it means even more than that. It means that millions of people now on this earth will never die a death of *any* kind. The Second Coming is at hand, ye know. It's all in the Book of Revelation, laddie, for those that's got the wit to read. We've only to bide a wee bit longer." And so with this electrifying thought I found myself out in the street.

Time passed. Somehow or other my nose was less frequently pressed against that shop window. It was perhaps a year or two later when, escaping the maternal shackles, I walked away to glance, as of yore, into the window. It was much as it had always been. But there was one



astounding and, to me, distressing difference. The golden legend had gone, and roughly where it had stood a framed notice saying "Under New Management" now reigned. I walked round to the door and peered in, looking for the old man with the bright eyes, but I could not see him. A tall, thin, much younger man with a stoop was busying himself behind

the counter. I had to know, so I went in.

As the door swung shut and the bell tinkled, the man turned towards me.

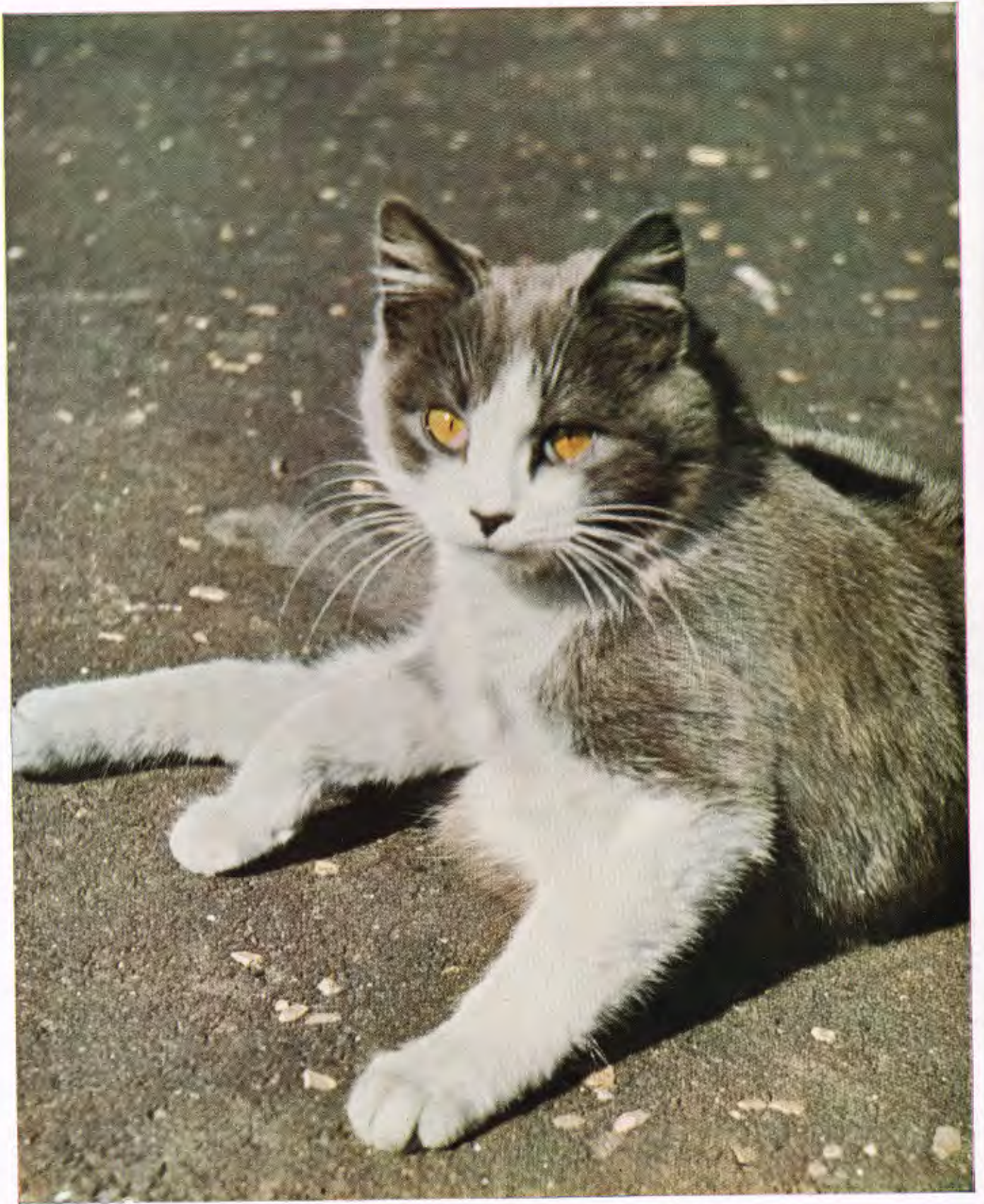
"I don't want to buy anything," I said hastily, "I just wanted to ask about the old gentleman that used to be here."

"Yes, well, what about him? There's a notice in the window says 'Under New Management.' Can't you read?"

"I can read fine," I replied, "but I don't understand it. Does it mean he has gone away?"

"He's gone away all right," said the man. "He's dead."

A terrible chillness suffused itself through every fibre of my body. I said not a word. I was too shattered for speech.



Whose cat ? (*see page 159*)